

unpatentable over Tino, U.S. Patent No. 5,978,017 in view of Ikeda et al. U.S. Patent No. 5,699,057. The Examiner indicated that Tino differs from the claimed invention in that only one camera is disclosed for making a film of a forward road environment when running, however, Ikeda teaches providing two CCD cameras mounted on a vehicle, therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the Tino reference and provide two cameras located on both sides of the rear/view mirror/camera assembly.

Regarding claims 2-5, these were objected to as being dependent upon a rejected base claim. However, the Examiner indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In response to this rejection, Applicant has amended claim 1 to clarify the feature of this invention, and claims 2 and 4 have been amended to be in independent form and claim 3 have been amended to be in dependent form which depends from claim 2. Furthermore, new claims 6-14 have been added. Based on the amended claims and new claims, Applicant respectfully requests reconsideration of this application.

Applicant's invention recited in claim 1 is related to the structure for mounting a pair of cameras (stereo cameras) having a pair of a right and left side cameras for keeping relative accuracy of each optical axis between the right and left cameras. The structure comprises a chassis and a mounting seat member where each of the pair of cameras is mounted on the one of right and left end portion of the chassis in lateral direction.

As explained in the specification in page 2, lines 31 to page 3, line 9, a conventional mounting structure is formed separately per each camera, that is, each camera is mounted on the different stay or some other structure. However, regarding conventional mounting structures, where each camera is mounted on the vehicle body separately, there are problems in that each position of the cameras is apt to be relatively tilted because of unavoidable unevenness when manufacturing the front windshield glass and a vehicle body. Furthermore, the relative accuracy of an optical axis between the cameras mounted on the both sides is apt to change because of vibration caused while running, a distortion of vehicle body and a temperature difference inside a vehicle, so that the accuracy of the obtained image data is lowered.

Applicant's invention is to solve these problems, as explained above, and the main

feature is to mount the pair of right and left side cameras on the right and left ends of a chassis (the same member) in the lateral direction, and fix the chassis to the vehicle body at the mounting seat member provided on the chassis.

In contrast to Applicant's invention, Tino discloses a multi-camera video recording system for a vehicle, where the system includes four-video cameras mounted inside a hollow molded plastic housing (22). The housing is mounted on the vehicle body (front windshield) through a hollow mirror mount structure (24). This housing has a mirror portion (25) and is, placed on the vehicle by replacing the existing rear view mirror. Each of the four-video cameras is aimed in the direction of the driver's seat, the passenger seat, rear window and the front windshield of the vehicle each other, In particular, the video camera aimed at the driver's seat is mounted on a contoured upper housing corners, the video camera aimed at the passenger's seat is mounted on an opposite side of the contoured upper housing corner.

Accordingly, Tino discloses a housing for mounting several video cameras, however, as the Examiner correctly indicated, Tino fails to disclose the pair of stereo cameras for obtaining an image signal of the forward road condition.

Regarding the camera of Tino, the reference discloses only one video camera for recording the front direction of the vehicle, and therefore it is the same as the conventional technology disclosed in the Applicant's specification. That is, there is no suggestion or teaching about mounting a pair of stereo cameras on the housing for forward viewing.

Furthermore, these video cameras of Tino are mounted independently, that is, the system only requires each video camera to aim at a different direction. There is no requirement for the video camera to be mounted on the housing with the positional relationship with other video cameras. Tino discloses the video camera aimed in the driver's seat direction and the other camera aimed in the passenger's seat direction are mounted on both upper end corners. However, these video cameras do not have a positional relationship, furthermore there is no requirement about relative accuracy of the optical axis between these video cameras.

Accordingly, there is no suggestion or teaching of mounting the pair of cameras, which is required to be mounted at a correct position with respect to each other so as to obtain accurate image data, on the housing (on the same member).

On the other hand, Ikeda discloses the warning system for a vehicle having a pair of

stereo scopic cameras. In particular, the pair of cameras is mounted on the ceiling of the compartment. However there is no detailed structure for mounting the pair of camera in the specification of Ikeda. In particular there is no disclosure of a member for mounting the pair of cameras. Furthermore, there is no suggestion or teaching of mounting the pair of cameras on the same member.

Therefore, Tino fails to disclose or suggest the pair of camera and mounting the pair of camera on the same member. Furthermore, Ikeda fails to disclose or suggest mounting the pair of camera on the same member. Therefore, Applicant believes that the references lack motivation to combine these references. Nothing in Ikeda would suggest changing the structure of Tino. Hence, Tino and Ikeda do not render the invention *prima facie* obvious under 35 USC 103(a).

Applicant respectfully requests the Examiner to reconsider Applicant's invention recited in claim 1.

Applicant's invention recited in claim 2 is related to the structure for mounting a pair of cameras, where the structure comprises a chassis, a mounting seat member formed on the center portion of the chassis, and a taper plate. The pair of cameras is mounted at the ends of the chassis. The chassis is mounted to the vehicle body by fixing the mounting seat member onto the vehicle body with the taper plate intervening between the mounting seat member and the vehicle body. The taper plate is provided to adjust minutely the mounting angle of the chassis, that is, by the taper plate, the direction of the optical axis of the right and left cameras mounted on the chassis can be easily adjusted.

Regarding the taper plate, Applicant believes that this is acknowledged as allowable subject matter by the Examiner in this Office Action.

In contrast to Applicant's invention recited in claim 2, as discussed above, Tino discloses the housing (22) for mounting the video cameras inside of the housing. Regarding the mounting structure of the housing, Tino discloses only replacing the existing rear view mirror with the housing by removing the existing rear view mirror. There is no disclosure or suggestion about the mounting structure in detail. Accordingly, Tino fails to disclose or suggest the taper plate defined in claim 2.

Furthermore, as discussed above, Ikeda discloses the pair of cameras mounted on the ceiling of the compartment. However, this disclosure indicates only an abstract mounting

position, there is no disclosure or suggestion of a particular mounting structure.

Accordingly, Tino and Ikeda fail to disclose or suggest the taper plate, and as this taper plate has been indicated as allowable subject matter, Applicant believes that claim 2 is in condition for allowance.

Regarding claim 3, this is a dependent claim which depends from claim 2, and defines the taper plate in detail. Accordingly, a plurality of taper plates having different taper angle are prepared in advance, the taper plate which has most adequate taper angle is selected and disposed between the mounting sheet member and the mounting position of the vehicle body.

Regarding this taper plate defined in claim 3, Applicant believes that this is also acknowledged as allowable subject matter by the Examiner in this Office Action. Furthermore, as discussed above, Tino and Ikeda fail to disclose or suggest the taper plate, and therefore Applicant believes that claim 3 is in condition for allowance.

With respect to claim 4, this defines the structure for mounting a pair of cameras, where the structure comprises a chassis, a mounting seat member formed on the center portion of the chassis, and falling prevention members provided at both ends of the chassis. The pair of cameras is mounted on the ends of the chassis. The chassis is mounted to the vehicle body by fixing the mounting seat member onto the vehicle body. Furthermore, the falling prevention members engage the chassis with the vehicle body. According to the falling prevention members, the chassis is prevented from falling when mounted in the chassis. Furthermore, it becomes easy to install the chassis to the vehicle body.

Regarding the falling prevention members, Applicant believes that these are acknowledged as allowable subject matter by the Examiner in this Office Action.

In contrast to Applicant's invention recited in claim 4, as discussed above, Tino discloses the housing and the hollow mirror mount structure. However, there is no disclosure or suggestion about the structure to engage the chassis with the vehicle body other than the hollow mirror mount structure, and accordingly, Tino fails to disclose or suggest the falling prevention members.

Furthermore, as discussed above, Ikeda only discloses the abstract mounting position of the pair of camera. There is no disclosure or suggestion about details of the mounting structure. Accordingly Ikeda fails to disclose or suggest the falling prevention members.

Therefore, Tino and Ikeda taken together fail to disclose or suggest the falling prevention members, and accordingly, the falling prevention members are allowable subject matter. Therefore, Applicant believes that claim 4 is in condition for allowance.

Regarding claim 5, this claim defines the falling prevention members discussed above as a dependent claim which depends from claim 2. As discussed above, Tino and Ikeda fail to disclose or suggest the falling prevention members, and accordingly the falling prevention member is allowable subject matter, Applicant believes that claim 5 is in condition for allowance.

Regarding claims 6 and 7, these claims define that the portion of the chassis other than the mounting seat member of the chassis is disposed or displaced apart from the vehicle body. Claim 6 defines the above subject matter as a dependent claim which depends from claim 2. Claim 7 defines the same subject matter as a dependent claim which depends from claim 4. For the same reason as given with regard to claims 2 and 4, Applicant believes that these claims 6 and 7 are in condition for allowance.

Regarding claims 8 and 9, these claims define that the mounting seat member supports all the weight of said chassis and said pair of cameras after said chassis is fixed to the vehicle body. Claim 8 defines the above subject matter as a dependent claim which depends from claim 2. Claim 9 defines the same subject matter as dependent claim which depends from claim 4. This feature is disclosed in the specification on page 7, lines 1-4. For the same reason as given with regard to claims 2 and 4, Applicant believes that these claims 8 and 9 are in condition for allowance.

Regarding claims 10-14, these have been added as new claims which depend from claim 1.

Claim 10 defines the sectional shape of the chassis, that is, the sectional shape is formed as a hooked sectional shape extending in a lateral direction. This feature is disclosed in the specification on page 6, lines 15 to 18 and Figure 5. According to this feature, the chassis can be prevented from being transformed due to a weight of the pair of cameras and acceleration while running.

In contrast to this feature, Tino discloses the housing for supporting the video cameras. However there is no disclosure about the hooked sectional shape sectional shape. Furthermore,

there is no suggestion of forming the housing to prevent it from being deformed due to the weight of the pair of cameras and vibration while running.

Moreover, as discussed above, Ikeda fails to disclose or suggest the mounting structure of the pair of cameras other than the abstract mounting position. Accordingly, Tino and Ikeda taken together fail to disclose or suggest the hooked sectional shape. Applicant believes that claim 10 is in condition for allowance.

Claim 11 defines the material of the chassis, the chassis is formed by one material having a high-coefficient of thermal conductivity. This feature is disclosed in the specification on page 5, lines 15 to 19, and page 7, lines 29 to 35. According to this feature, the thermal conduction is performed quickly, and therefore the chassis can keep a thermal balance between said pair of cameras, and this means there occurs little temperature difference between the pair of cameras even if only one camera is exposed to daylight.

In contrast to this feature, Tino discloses the housing formed by a plastic, however, there is no disclosure or suggestion about the material having the thermal conductivity for keeping a thermal balance between the pair of cameras.

Furthermore, Ikeda fails to disclose or suggest the mounting structure of the pair of cameras including the material. For this reason, Applicant believes that claim 11 is also in condition for allowance.

Claims 12 defines that the material is an aluminum alloy. This feature is disclosed in the specification on page 5, lines 15 to 19, and page 7, lines 29 to 35. Tino and Ikeda fail to disclose or suggest that the aluminum alloy can be used as the material of the chassis. Furthermore, for the same reason as given with regard to claim 11, Applicant believes that claim 12 is in condition for allowance.

Claim 13 defines that the mounting seat member is fixed to the front rail of the vehicle body. This feature is disclosed in the specification page 5, lines 29 to 33.

Regarding this feature, Tino discloses, in figure 5, the housing mounted on the front window shield. Furthermore, Ikeda discloses that the pair of CCD cameras is mounted on the ceiling of the compartment. However, only as abstract mounting position is mentioned and there is no explanation in detail. Accordingly, there is no disclosure or suggestion about mounting the chassis onto the front rail of the vehicle body. Therefore, Applicant believes that claim 13 is in

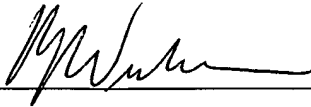
condition for allowance.

Claim 14 defines that the mounting seat member supports all weight of said chassis and said pair of cameras after said chassis is fixed to said vehicle body. This feature is disclosed in the specification on page 7, lines 1-4. For the same reason as given with regard to claims 1, Applicant believes that claim 14 is in condition for allowance.

In view of the above, Applicant submits that the application is now in condition for allowance. Accordingly, an early and favorable action is respectfully requested.

Respectfully submitted,

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Marked Up Copy of Claim

1. (amended) A structure for mounting cameras on a vehicle, comprising:

a chassis having a predetermined length and extended in a lateral direction of a vehicle body;

a pair of stereo cameras [mounted on both sides of a vehicle] having a camera on the right and left sides for [making a film] obtaining an image signal of a forward road environment [when running] of said vehicle, each [camera] of said right side and left side cameras being mounted on [both] each right side and left side ends of said chassis in said lateral direction having a positional relationship to each other; and

a mounting seat member formed in a center of said chassis and for fixing onto a predetermined mounting position of said vehicle body so as to mount said pair of cameras on said vehicle body;

[wherein said mounting seat member is fixed onto a predetermined mounting position of a vehicle body so as to mount said pair of cameras on the vehicle body, and]

portions of said chassis other than said mounting seat member [of the chassis] are disposed apart from the vehicle body when said chassis is mounted in said vehicle.

2. (amended) [The] A structure for mounting cameras on a vehicle [according to claim 1], [further] comprising:

a chassis having a predetermined length and extended in a lateral direction;

a pair of stereo cameras mounted on said chassis with for obtaining an image signal of a forward road environment, each camera being mounted on both ends of said chassis; and

a mounting seat member formed in a center of said chassis and for fixing onto a predetermined mounting position of said vehicle body; and

a taper plate intervenient between said mounting seat member and [the] said mounting position on the vehicle body when fixing said chassis onto the mounting position of the vehicle body.

3. (amended) The structure for mounting camera on a vehicle according to claim [1] 2, [further comprising] wherein:

said taper plate is one of a plurality of taper plates prepared in advance which are formed by wedge-like plates with different taper angle when fixing said chassis onto the mounting position of the vehicle body,

wherein

said taper plate [having] has the most adequate taper angle [of] among said plurality of taper plates, and intervenes between said mounting seat member and the vehicle body so as to dispose said pair of cameras mounted on said chassis in the predetermined mounting position of the vehicle body.

4. (amended) [The] A structure for mounting cameras on a vehicle [according to claim 1], [further] comprising:

a chassis having a predetermined length and extended in a lateral direction;

a pair of stereo cameras mounted on both ends of said chassis for obtaining an image signal of a forward road environment;

a mounting seat member formed in a center of said chassis and fixed onto a predetermined mounting position of said vehicle body; and

falling prevention members for engaging the both ends of said chassis with the vehicle body.

b2 6. (new) The structure for mounting cameras on a vehicle according to claim 2, wherein portions of said chassis other than said mounting seat member are disposed apart from said vehicle body when said chassis is mounted on said vehicle.

7 (new) The structure for mounting cameras on a vehicle according to claim 4, wherein portions of said chassis other than said mounting seat member are disposed apart from said vehicle body when said chassis is mounted on said vehicle.

8. (new) The structure for mounting cameras on a vehicle according to claim 2, wherein said mounting seat member supports all weight of said chassis and said pair of cameras

after said chassis is fixed to said vehicle body.

9. (new) The structure for mounting cameras on a vehicle according to claim 4, wherein said mounting seat member supports all weight of said chassis and said pair of cameras after said chassis is fixed to said vehicle body.

10. (new) The structure for mounting cameras on a vehicle according to claim 1, wherein said chassis having a hooked sectional shape extending in a lateral direction.

11. (new) The structure for mounting cameras on a vehicle according to claim 1, wherein said chassis is formed by one material having a high-coefficient of thermal conductivity for performing the thermal conductivity quickly so as to keep a thermal balance between said pair of cameras.

12. (new) The structure for mounting cameras on a vehicle according to claim 11, wherein said chassis is formed from an aluminum alloy.

13. (new) The structure for mounting cameras on a vehicle according to claim 1, wherein said mounting seat member is fixed onto a front rail of said vehicle body.

14. (new) The structure for mounting cameras on a vehicle according to claim 1, wherein said mounting seat member supports all weight of said chassis and said pair of cameras after said chassis is fixed to said vehicle body.